WHAT WE CLAIM IS:

1. A zoom lens system comprising in order from an object side of said zoom lens system:

a first lens group having positive refracting power,

a second lens group that has negative refracting power and moves from an object side to an image plane side of said system during zooming from a wide-angle end to a telephoto end of said system,

a third lens group having positive refracting power, and

a fourth lens group that has positive refracting power and is movable during zooming, wherein:

said first lens group comprises two lenses, a negative lens and a positive lens, or one positive lens alone,

said third lens group comprises three lenses, a positive lens, a positive lens and a negative lens, or two lenses, a positive lens and a negative lens, and

said third lens group has at least one aspherical surface therein,

provided that said zoom lens system satisfies the following condition (10):

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \qquad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

2. The zoom lens system according to claim 1, wherein the positive lens and negative lens in said third lens group are cemented together.

3. The zoom lens system according to claim 1 or 2, wherein said third lens group moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end.

4. The zoom lens system according to claim 1, wherein said first lens group remains fixed during zooming.

5. The zoom lens system according to claim 1, wherein said second lens consists of two lenses, a negative lens and a positive lens from the object side.

6. The zoom lens system according to claim 1, wherein said fourth lens group consists of one positive lens alone.

7. The zoom lens system according to claim 1, which satisfies the following condition (a):

$$0.3 < |L_3|/|L_2| < 1.0 \quad \cdots \text{(a)}$$

where L_2 is an amount of said second lens group from the wide-angle end to the telephoto end, and L_3 is an amount of said third lens group from the wide-angle end to the telephoto end.

8. The zoom lens system according to claim 1, wherein said second lens group has at least one aspherical surface therein.

9. The zoom lens system according to claim 1, wherein said fourth lens group has at least one aspherical surface therein.

10. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting

power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, and satisfying the following conditions (1) and (10):

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

11. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, and satisfying the following conditions (2) and (10):

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where L_i is an amount of movement of an i-th lens group from the wide-angle end to the telephoto end, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

12. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming,

provided that said zoom lens system satisfies the following conditions (3) and (10):

$$2 < (F_{3,\ 4W})/IH < 3.3 \quad \cdots (3)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where $(F_{3,\ 4W})$ is a composite focal length of said third and fourth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

13. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and a fourth lens group that has positive refracting power and is movable during zooming, wherein:

said third lens group comprises, in order from an object side thereof, a positive lens convex on an object side thereof and a doublet consisting of a positive lens convex on an object side thereof and a negative lens concave on an image side thereof, and peripheries of object side-directed convex surfaces of both said object-side positive lens and said doublet in said third lens group are held by a lens holder barrel while said convex surfaces are abutting at said peripheries or some points on said lens holder barrel, provided that said zoom lens system satisfies the following condition (10):

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

14. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during

zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming,

provided that said zoom lens system satisfies the following conditions (1), (2) and (10):

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, L_i is an amount of movement of an i-th lens group from the wide-angle end to the telephoto end, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

15. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end to

the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming,

provided that said zoom lens system satisfies the following conditions (1), (3) and (10):

$$0.5 < |F_2/F_3| < 1.2 \qquad \cdots (1)$$

$$2 < (F_{3,\ 4W})/IH < 3.3 \qquad \cdots (3)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \qquad \cdots (10)$$

where F_i is a focal length of an i-th lens group, $(F_{3,\ 4W})$ is a composite focal length of said third and fourth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

16. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming,

provided that said zoom lens system satisfies the following conditions (2), (3) and (10):

$$0.49 < |L_3/L_2| < 1 \qquad \cdots (2)$$

$$2 < (F_{3,\ 4W})/IH < 3.3 \quad \cdots (3)$$

$$2.5\ mm < f_{B(min)} < 4.8\ mm \quad \cdots (10)$$

where L_i is an amount of movement of an i-th lens group from the wide-angle end to the telephoto end, $(F_{3,\ 4W})$ is a composite focal length of said third and fourth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

17. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming,

provided that said zoom lens system satisfies the following conditions (1), (2), (3) and (10):

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2 < (F_{3,\ 4W})/IH < 3.3 \quad \cdots (3)$$

$$2.5\ mm < f_{B(min)} < 4.8\ mm \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, L_i is an amount of movement of an i-th lens group from the wide-angle end to the telephoto end, $(F_{3,\ 4W})$ is a composite focal length of said third and fourth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

18. The zoom lens system according to any one of claims 10, 11, 12, and 14 to 17, which satisfies the following condition (4):

$$0.6 < |F_2/F_3| < 1 \qquad \cdots (4)$$

where F_i is a focal length of an i-th lens group.

19. The zoom lens system according to claim 17, wherein said fourth lens group moves along an optical axis direction for focusing.

20. The zoom lens system according to claim 17, which satisfies the following condition (5):

$$0.3 < F_3/F_4 < 0.8 \qquad \cdots (5)$$

wherein F_i is a focal length of an i-th lens group.

21. The zoom lens system according to claim 17, which satisfies the following condition (6):

$$0.4 < |\beta_{2T}| < 1 \qquad \cdots (6)$$

where β_{2T} is a lateral magnification of the second lens group of the telephoto end of said system.

22. The zoom lens system according to claim 17, wherein said fourth lens group consists of one positive lens.

23. The zoom lens system according to claim 17, wherein said third lens group consists of three lenses, a positive lens, a positive lens and a negative lens in order from an object side thereof.

24. The zoom lens system according to claim 17, wherein at least one surface in said third lens group is an aspherical surface.

25. The zoom lens system according to claim 17, wherein at least one surface in said fourth lens group is an aspherical surface.

26. The zoom lens system according to claim 17, wherein at least one surface in said second lens group is an aspherical surface.

27. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, wherein said first lens group consists of one positive lens, and a lens in said second lens group that is located nearest to an object side thereof is a negative lens,

provided that said zoom lens system satisfies the following conditions (7) and (10):

$$\nu_{21} < 40 \quad \cdots (7)$$

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \quad \cdots (10)$$

where ν_{21} is an Abbe's number of said negative lens located nearest to the object side of said second lens group, and $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

28. The zoom lens system according to claim 27, which satisfies the following condition (8):

$$\nu_{21} < 35 \quad \cdots (8)$$

29. The zoom lens system according to claim 17, which satisfies the following condition (7):

$$\nu_{21} < 40 \quad \cdots (7)$$

where ν_{21} is an Abbe's number of the negative lens located nearest to the object side of said second lens group.

30. The zoom lens system according to claim 17, which satisfies the following condition (8):

$$\nu_{21} < 35 \quad \cdots (8)$$

where ν_{21} is an Abbe's number of the negative lens located nearest to the object side of said second lens group.

31. The zoom lens system according to claim 17 or 27, wherein said third lens group comprises, in order from an object side thereof, a positive lens convex on an object side thereof and a doublet consisting of a positive lens convex on an object side thereof and a negative lens concave on an

image plane side thereof, and peripheries of object side-directed convex surfaces of both said object-side positive lens and said doublet in said third lens group are held by a lens holder barrel while said convex surfaces are abutting at said peripheries or some points on said lens holder barrel.

32. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves constantly from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, wherein said third lens group comprises a doublet consisting of a positive lens and a negative lens, and said fourth lens group comprises one positive lens,

provided that said zoom lens system satisfies the following condition (10):

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

33. The zoom lens system according to claim 32, wherein at least one surface of the positive lens in said fourth lens group is an aspherical surface.

34. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves constantly from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, wherein each of said second and third lens groups comprises a doublet consisting of a positive lens and a negative lens,

provided that said zoom lens system satisfies the following condition (10):

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

35. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power

power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves constantly from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that has positive refracting power and is movable during zooming, wherein said third lens group comprises, in order from an object side thereof, a positive lens, and a doublet consisting of a positive lens and a negative lens,

provided that said zoom lens system satisfies the following condition (10):

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

36. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein during zooming, a space between said first and second lens groups, a space between said second and third lens groups and a space between said third and fourth lens groups vary independently, said third lens group comprises, in order from an object side thereof, a double-convex positive lens, and a doublet consisting of a

positive meniscus lens convex on an object side thereof and a negative meniscus lens, and said fourth lens group comprises a double-convex lens having a large curvature on an object side surface thereof,

provided that said zoom lens system satisfies the following condition (10):

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

37. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein during zooming, a space between said first and second lens groups, a space between said second and third lens groups and a space between said third and fourth lens groups vary independently, said first lens group comprises one positive lens, said second lens group comprises three lenses or, in order from an object side thereof, a single lens and a doublet consisting of a negative lens and a positive lens, said third lens group comprises three lenses or, in order from an object side thereof, a single lens and a doublet consisting of a positive lens and a negative lens, and said fourth lens group comprises one positive lens,

provided that said zoom lens system satisfies the following condition (10):

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

38. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein during zooming, a space between said first and second lens groups, a space between said second and third lens groups and a space between said third and fourth lens groups vary independently, said first lens group comprises two lenses or a positive lens and a negative lens, and said second or third lens group comprises a doublet consisting of at least one set of a positive lens and a negative lens,

provided that said zoom lens system satisfies the following condition (10):

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is minimized in an overall zooming zone.

39. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group that has positive refracting power and remains fixed during zooming, a second lens group that has negative refracting power and moves from an object side to an image plane side of said zoom lens system during zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group that has positive refracting power and moves constantly from the image plane side to the object side during zooming from the wide-angle end to the telephoto end and a fourth lens group that comprises one lens component, has positive refracting power and is movable during zooming, wherein each of said second and third lens groups comprises a doublet consisting of a positive lens and a negative lens, and said third lens group or said fourth lens group has at least one aspherical surface therein.

40. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein during zooming, a space between said first and second lens groups, a space between said second and third lens groups and a space between said third and fourth lens groups vary independently, said first lens group comprises one positive lens, said second lens group comprises three lenses or, in order from an object side thereof, a single lens and a doublet consisting of a negative

lens and a positive lens, said third lens group comprises three lenses or, in order from an object side thereof, a single lens and a doublet consisting of a positive lens and a negative lens, said fourth lens group comprises one positive lens, and said third lens group or said fourth lens group has at least one aspherical surface therein.

41. The zoom lens system according to any one of claims 1, 10 to 17, 27, and 32 to 40, which satisfies the following condition (11):

$$2.5 \text{ mm} < f_{B(max)} < 4.8 \text{ mm} \quad \cdots (11)$$

where $f_{B(max)}$ is a value obtained when a length, as calculated on an air basis, from a final surface of a powered lens in said zoom lens system to an image plane is maximized in an overall zooming zone.

add B11

add C1